Genera of the Araneine Argiopidae Found in the Oriental Region, and Generally Placed under the Comprehensive Genus, *Araneus*. (1)

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In recnet years revisions have been made of the very comprehensive genus *Araneus* (also Aranea), a genus made comprehensive by Simon in his authoritative work, Histoiae Naturelle des araignées, 2 nd editien, 1895, vol. 1. In coming to his decision Simon sunk in the synonymy genera described during the ninteenth century, so comletely in fact that recent revisers were not even aware of their existence until the same genera had been redescribed and in print. After the publication of Simon's monumental woak sporadic attempts to erect new genera out of the *Araneus* were again made, as we can see in the case of the work of F.O.P. -Cambridge in 1902. Simon hiself had made his decision on the basis of eye characters which are at best not too satisfactory when applied to genera, and these along with general external features of shape and form. The result of all this was a ponderous and artificial genus under the heading of *Araneus*. It is to the credit of R.V. Chamberlin and Ivie that a consistent effort was recently made to name and define genera included under the heading of *Araneus*, and to point the way towards limiting *Araneus* to its proper bondaries. This sort of work has been continued by the authors, and in following Chamberlin's example much emphasis is being placed on the importance of the genitalic features of both sexes. The use of genitalia, however, is not accepted by some individuals, and as recently as 1952 Petrunkevitch (Principles of Classification, Systematic Zoology, vol. 1, pp. 1-19, 1952) unsuccesfully attempted to refute the use of genitalia in the categories of classification of gener and higher entities in favor of his obseure system, based partly the anatomy of the circulatory and respilatory system. The use of genitalia is workable and therefore valid not only at the level of species but also at the level of the genus, family and suborder. The fact that it is workable, and jibes with phylogeny is the strongest of arguments in its favor. Moreover, if genitalia are utilized in combination with certain characters such as the carapace, appendages, abdominal musculature and even the poison sacs, the result proves to be a harmonious and consistent product of taxonomy.

In this paper we are bringing together for the first time by definitions and taxonomic arraogement genera formerly placed under *Araneus*, and which occur in the Oriental Region and adjacent Holarctic areas. The principal revisions proposed by one of the authors have dealt with world genera of Argiopidae (American Museum Novitates, 1951) or with European genera (Natural History Miscellanea, 1951). Since the appearance of the above papers additional facts have pointed the way to furfher revisions and modifications of the genera treated previously.

In the present work it is indicated that the genera defined further on are themslves divisible into two groupe. The more deravative genera have reversed the entire direction of the apical division of the genital bulb of the male palpus with an accompanying relocation of the openings of the epigynum. This reversers completly the prevalent pattern found both primitively and widely in the Argiopidae, in much the same manner as the change from righthandedness to lefthandedness.

Key to Genera:

A. Genera having the following general characterstics:
  - ♀ Opening of the epigynum posterior, more or less caudad.
  - ♂ Embolic division of genitalia bulb of the palpus curving (twisting) with ectally (i.e. from inside position to the outside) with reference to the median apophysis. The *Nephila* position.

B. Genera having the following characheristics.
  - ♀ Opening of the epigynum anterior.
  - ♂ Embolic division of the genital bulb of the palpus curving (twisting) endally (from outside position towards the inside face) with reference to the median apophysis. The *Araneus* position.

Genera under A.

Heurodes KEYSERLING, 1886.(=*Simonarachne* ARCHER=*Eriovixia* ARCHER)

Type: *Heurodes turrita* KEYS.

Male palpus having the median apophysis a wide blade, comb-like and with a fluted surface. Palpal patella having a single apical snipe. Female epigynum characteaized by a rather short, bluntly blade-like scape overshadowing the anterior plates. Female cephalon elevated posteriorly with sloping sides and a rather complanate summit; cervical grooves not impressed nor convergent, and pit practically absent. Lateral eyes of both sexes almost touching. Female abdomen tapering posteriorly into a caudal projection, in some instances rather long and slender. Rather small spiders.

Examples: *Heurodes fratrella* (CHAMBERLIN), China.
H. pseudocentrodes (BOES. et STR.), Japan.

Catheistela ARCHER, 1959

Type: *Catheistela ventricosa* (L. KOCH).

Male palpus having a transvers median apophysis on a rather narrow base, shaped like an inverted triangle, endal spur present (inner end) and ectal crest emarginate (Outside position). Paracymbium normal, stout. Palapal patalla having two apical spines. Female epigynum having a widely expanded, bilobate plate; scape rather wide, varying from long to short. Female carapace having the cervical grooves not converging on the narrow pit; cephalon elevated behind the ocular quadrangle; front margin curved, not angularly trilobate as in *Araneus*. Lateral eyes of both sexes separated. Female abdomen triangularly ovate to elongate ovate, sometimes with shoulder cones. Spiders varying from large to medium-sized.

Examples other than the genotype: *Catheistella ishisawai* (KISHIDA), *C. opima* (L. KOCH) *C. fuscocolorata* (B. et S.), *C. pentagrammica* (KARSCH).

Neoscona SIMON, 1864. (=*Chinestela* CHAMBERLIN, Subgenus *Neosconopsis* ARCHER)

Type: *Neoscona arabesca* (WALCK.)

Male palpus having the median apophysis located on a rather narrow base, anatoid in shape (like a decapitated duck), and with a suberect spur located on the summit and over towards the middle; apical division of the genital bulb having all elements characteristically short. Palpal patella having two apidal spines. Female epynum characterized by a uniformly chitinized scape with a curved, downwardly bending rounded tip; a pair of lateral expansions behind the tip region; marging of the scape dense and raised. Female carapace very pubescent; shallow cervical grooves not convergent on the narrow pit; front margin curved rather than angularly trilobate. Lateral eyes of male either connate on a cone, or slightly separated; Lateral eyes of female slightly separate. Abdamen pubescent, at least on the margin; ovate. Spiders varying from large to less than medium size.

Ezamples ; *Neoscona adianta* (WALCK.), *N. scylla* (KARSCH), *N. scylloides* (B. et S.), *N. mellotteeei* (SIMON), *N. nautica* (L. KOCH), *N. doenitzi* (B. et S.), *N. theisi* (WALCK.)

Afraranea ARCHER, 1951.

Type : *Afraranea sanguipes* (THOR,)

Male palpus having an erect median ayophysis, higher than wide, tipped by a subacute spur that lenas ectally (to the outside). Female epigynum characterized by a scape, usually but not always chitinized. with the blunt tip forming a down curved loop, its margins raised but narrow, not thickened. Female carapace rather smooth, except possibly for a posterior patch of bristles just in front of the pit ; cervical grooves shallow, not converging, ending far short of the rather narrow pit ; cephalon sometimes very convexly elevated, its front margin curvd, not angularly trilobate as in *Araneus*. Lateral eyes of both sexes separated. Female abdomen widely ovate ; shoulder cones rarely present. Spiders varying from rather large to less than medium size.

Examples : *Afraranea rufofemorata* (SIMON)=*rumphi* THORELL, *A. mitifica* (SIMON)

Agalentaea ARCHER, 1951.

Type : *Agalenatea redii* (SCOPOLI).

Male palpus having an erect median apophysis, higher than wide surmounted by an apical spur which inclines endally (towards the inner side) Palpal patella having two apical spines. Female epigynum characterized by a very wide, short scape, having raised margins. Female carapace having the weakly impressed cervical grooves very short, not converging on the wide shallow pit ; cephalon elevated Lateral eyes of both sexes very narrowly separated. Female abdomen widely ovate, having very blunt shoulder cones. Spiders of barely medium size or less.

Examples. *Agalenatea ejusmodi* (B. et S.), *A. acropicta* (SCHENKEL), *A. angulopicta* (SCHENLEL) (recently described from China)

Genera under B.

Aculepeira CHAMBERLIN & IVIE, 1942.

Type : *Aculepeira aculeate* (EMERTON)

Male palpus having the median apsphysis in the form of an elongated, solid and slightly curved strip ; upper endal corner having bifurcated spurs ; ectal end emerginate. Palpal patella having two apical spines. Femal epigynum characterized by a wide scape which tapers subacutely, and covers the caudally expanding plates. Female carapace having long cervical grooves whicn converge on the wide pit; cephalon quite smooth, contrasting thus with the hirsute thoracic division. Lateral eyes of both sexes narrowly separated. Female abdomen ovate, shaggy, Pubescent. Spiders of medium size or less.

Besides the species lised as the genotype, these are number of species in the Holarctic Region, including widely dispersed species such as *Aculepeira carbonaria* (L. Koch) and *A. ceropegia* (Walck.)

Gibbaranea ARCHER, 1951.

Type: *Gibbaranea bituberculata* (WALCK.)

Male palpus having an elongated, boat-shaped median apophysis, broad based, and with a tapering, upcurved endal spur; apical division of the genital bulb more depressed and reduced than usual in related genera. Palpal patella having two apical spines. Female epigynum characterized by a scape having very raised edges and a spoon-shaped tip, lying over widely expanded plates which form on each side a rim around anterior pits. Female carapace pubescent, having the cervical grooves not convergent on the wide pit; cephalon expanding convexly behind ocular area, its summit complanate. Lateral eyes of both sexes separated. Female abdomen elevated, of ten having prominent, closely placed shoulder cones. Spiders less than medium size.

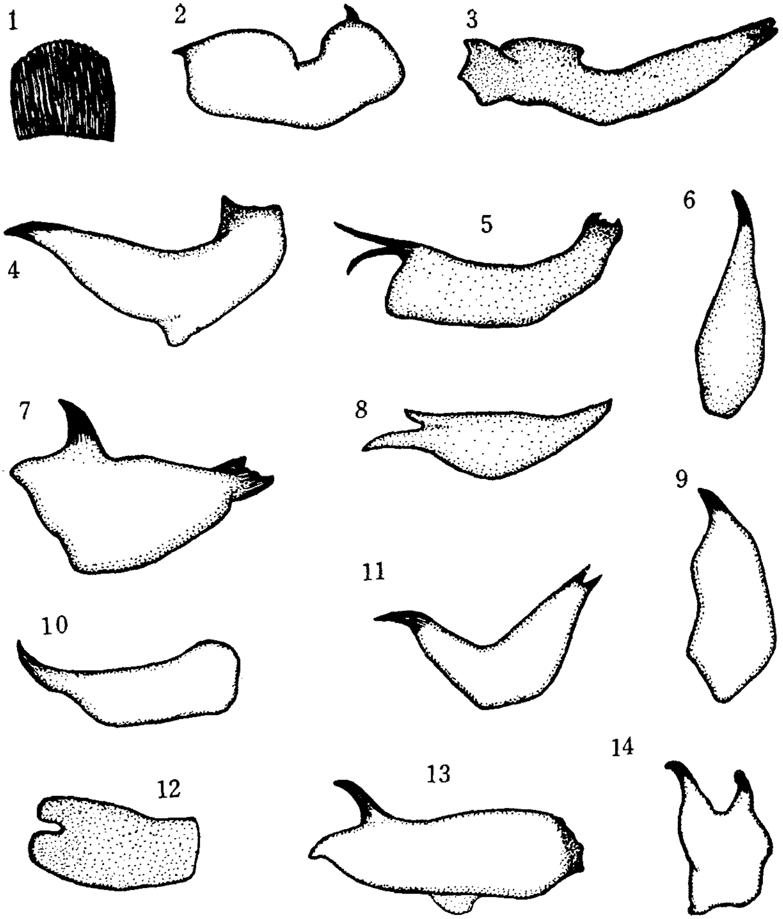
Example: *Gibbaranea omoeda* (THORELL).

Araneus CLERCK, 1757. (=*Aranea* L. (in part)

Type: *Aranea angulata* CLERCK.

Mele palpus having the median apophysis anatoid shape, broadly based (unlike Neoscona) with the principal spur varying from trulyendal to nearly midway in position summit. Palpal patella having two apical spines. Female epigynum having a scape varying from short and wide to long with a spoon-shaped tip; behind and on either side of the scape lie a pair of lozenge-shaped plates, each one sometimes double. Female carapace having the cervical grooves convergent on a narrow, transverse pit; cephalon angular at the corners of the lateral eyes, giving the front margin a trilobate appearance. Lateral eyes of both sexes separated. Female abdomen varying from ovate to broadly ovate; sometimes triangular with elevated cones on each shoulder. Spiders varying from large to medium sized.

This genus comprises such species as ***Araneus diadematus*** CLERCK, *A.*



Median apophysis of malepalp.

1. Heurodes 2. Zilla 3. Eriophora 4. Cathaistela
5. Aculepeira 6. Afraranea 7. Aranea 8. Araniella
9. Agalenatea 10. Gibbaranea 11. Atea 12. Cyphepeira
13. Neoscona 14. Larinia

quadratus CLERCK, *A. piatus* ROEWER (= *pia* CHAMBERLIN), and *A. pinguis* (KARSCH).

Atea C. KOCH, 1837. (=*Conaranea* ARCHER), (Subgenus *Mimaranea* ARCHER).

Type: *Atea sturmi* HAHN.

Male palpus having a boat-shaped median apophysis with a rather narrow base; endal spur slanting diagonally upwards, and ectal elevation emarginate. Palpal patella having two apical spines. Female epigynum having a rather long scape, flexible and with a spoon-shaped tip; on either side of the secape lies a convex plate. Female carapace having cervical grooves not quite convergent on the narrow pit; cephalon pubescent, having scattered bristles throughout. Lateral eyes of both sexes narrowly separated. Female abdomen subtriangular, having more or less blunt shoulder cones. Spiders less than medium size.

Besides the genotype species *Atea triguttata* (FABR.) and *A. abcissa* (BOES. et STR.) may be cited as characteristic species.

Larinia SIMON, 1874 (=*Drexelia* MCCOOK.)

Type: *Larinia dufourni* SIMON.

Male palpus having an erect median apophysis in the form of wide, curved plate with a rather narrow base, and surmounted at each upper corner by a suberect spur; sometimes an extra spur present. Palpal patella having a pair of apira spines. Female epigynum consisting of a wide, short scape, on either side of which are extensive expanding, but not very convex plated. Female carapace rather elongated with the cervical grooves not convergent on the narrow longitudinal fissur-like pit; cephalon smooth. Lateral eyes of male connate; Lateral eyes of female very narrowly separated. Female abdomen elongate-ovate, sometimes extremely elongate. This worldwide genus is related closely to the North American genus *Conepeira* ARCHER, 1951. Spiders of less than medium size.

Example; *Larinia punctifera* BOES. et STR.

Araniella CHAMBERLIN & IVIE, 1942.

Type: *Araniella displicata* (HENTZ).

Male palpus having a very transverse medinn apophysis which is wide in contrast with the narrow base; each end of this apophysis produced in the form of a long, narrow spur, usually with an accessory endal spur on the upper corner. Female epigynum having a short, thick scape which does not taper, on either side of which lie bilobate plates, together forming an arch. Female calapace having cervical grooves nearly but not quite convergent on the arcuate pit; cephalon smooth. Lateral eyes of both sexes narrowly separated. Abdomen oval and with a delicate apple green color, Small spiders.

Examples: *Araniella displicata* (HENTZ), *A. cucurbitina* (L.).

Cyphepeira ARCHER, 1951. =*Epeira* WALCK. (in part), CHAMBERLIN & IVIE, 1947 (*Epeira* same as *Araneus* acc. to Bonnet)

Type: *Cyphepeira silvicultrix* (C. KOCH)

Male palpaus characterized by a median apophysis projecting at right angles to the genital bulb, spatula-shaped, longer than wide with a maginate or bifid tip. Palpal patella having two apical spines. Female epigynum characterized by a widely a subdivided, expanding plate, lying behind anterior openings; scape small ane slender, or totolly missing. Female carapace haveng deeply impressed cervical grooves which do not converge on the transverse pit; cephalon very pubescent. Lateral eyes of both sexses separated. Female abdomen either oval (appearing much as in *Zygiella* and *Metazygia*) or else widest in front of the mid line, its dorsum either pubescent or smooth (usually the latter). Spiders varying from medium size to rather large.

Examples: *Cyphepeira sclopetaria* (CLERCK), *C. patagiata* (CLERCK), *C. cornuta* (CLERCK)

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